

# SERVICE BULLETIN



M-1066

December 20, 1996

## ELECTRONIC FUEL INJECTION UPDATE

This bulletin covers the following important matters related to fuel injection:

- The end of fuel injection module replacement through the service department.
- 1997 Scanalyzer software upgrade cartridge.
- The release of 12 new fuel injection service kits to be available in January, 1997.
- Fuel injection service kit installation instructions and job time/codes.

### Fuel Injection Program Ends

The fuel injection program, began in 1995 (see Service Letter ML-336), offered complete module replacement when a fuel injection module or module component problem was confirmed by the service department. Harley-Davidson is pleased that there were very few actual problems with the fuel injection components (less than 3 in 1000 vehicles). Most reported problems have been either misdiagnosed or wiring-related.

This indicates little need for dealers to have a large inventory of fuel injection parts. It also indicates a great need for proper problem diagnosis by service personnel. The Scanalyzer, service manual diagnostics and the various component testing tools should be used when problems occur. The Data Monitor menu in the Scanalyzer should also be used, especially when a problem is occurring but there is no "Check Engine" light.

### 1997 Scanalyzer Software Upgrade Cartridge

Under certain conditions, the 1997 Scanalyzer cartridge (Kent-Moore Part No. HD-41325-97) may display incorrect codes. Erroneous codes could be displayed if the ignition switch is turned off while the Scanalyzer remains connected to the motorcycle. To prevent erroneous codes from being displayed, disconnect the Scanalyzer before turning the ignition off. If any doubts exists about the accuracy of the codes displayed by the 1997 cartridge, the 1995 cartridge can be used instead. Using the 1995 cartridge will eliminate the potential problem but will not allow use of the recording feature which is built into the 1997 cartridge. New replacement cartridges with upgraded software will soon be available on an exchange basis (Kent-Moore Part No. HD-41325-97A). Kent-Moore will replace the 1997 cartridges using the same procedure that was used during the 1997 XL fork spring compressor exchange program. Shipment of -97A replacement cartridges will begin February 7, 1997. A form required for the exchange will be sent out by Kent-Moore prior to the shipment date.

### Fuel Injection Service Kits

#### NOTE

*Items within kits that have part numbers may be ordered separately as service parts. Items without part numbers are available only in the kit.*

### 1. Intake Air Temperature Sensor Kit No. 27270-95

Item	Part No.	Qty.
Air Temperature Sensor	-	1
Attaching Screw	-	2
Gasket	-	1

### 2. Throttle Position Sensor Kit No. 27271-95

Item	Part No.	Qty.
Throttle Position Sensor	-	1
Attaching Screw	-	2
Washer	-	2

### 3. Fuel Injector Kit No. 27218-95

Item	Part No.	Qty.
Fuel Injector (w/O-rings)	27218-95	1

### 4. Fuel Pressure Regulator Kit No. 27219-95

Item	Part No.	Qty.
Fuel Pressure Regulator (w/O-rings)	27219-95	1

## 5. Idle Speed Control Actuator Kit No. 27272-95

Item	Part No.	Qty.
Idle Speed Control Actuator w/clip	27596-95	1
Screw	-	2
Idle Speed Lever	27595-95	1
Spacer	27597-95	1
Throttle Shaft Lockwasher	-	1
Throttle Shaft Nut	-	1
Idle Speed Adjustment Screw	-	1

## 6. O-ring Kit No. 17043-95

Item	Part No.	Qty.
Injector O-ring (Bottom)	-	2
Fuel Pressure O-ring (Top)	-	1
Fuel Pressure O-ring (Bottom)	-	1
Fitting O-ring (Internal)	-	2
Fitting O-ring (Middle)	27244-95	2
Fitting O-ring (Top)	-	2

## 7. Cam Lever Assembly Kit No. 27274-95

Item	Part No.	Qty.
Spring Pin	379	1
Lever Retaining Spring	-	1
Screw, Throttle Spring Retainer	-	1
Spacer	27597-95	2
Throttle Shaft Lockwasher	-	1
Throttle Shaft Nut	-	1
Cam Lever Assembly	27598-95	1
Shaft Lever	-	1
Throttle Return Spring	-	1
Throttle Spring Retainer	-	1

## 8. Adjustment Screw Kit No. 27217-95

Item	Part No.	Qty.
Idle Speed Adjustment Screw	27217-95	2

## 9. Electronic Control Module (ECM) Kit No. 32423-97 (for 1995-97 Domestic and 1996 HDI)

Item	Part No.	Qty.
Electronic Control Module (ECM) for 1995-1997 Domestic EFI models and 1996 HDI EFI models	32423-97 (supercedes 32423-95A)	1

## 10. Electronic Control Module (ECM) Kit No. 32476-97 (for 1997 HDI)

Item	Part No.	Qty.
Electronic Control Module (ECM) for 1997 HDI EFI models	32476-97	1

## 11. Fuel Fitting Kit No. 27221-95

Item	Part No.	Qty.
Fuel Fitting	27221-95	1

## 12. Fuel Pressure Regulator Clamp Plate Kit No. 27282-95

Item	Part No.	Qty.
Top Clamping Plate	-	1
Nut	-	1
FPR Plate Assembly	-	1

## Installation Instructions

### CAUTION

The throttle shaft, throttle plates and air intake adjustment screws are factory-assembled using special techniques and are NOT servicable items. Removal of any of the above components will void the warranty and require the purchase of a new induction module.

### NOTE

See Figure 1 on following page for component locations.

- Intake Air Temperature Sensor Installation (Kit No. 27270-95)
- O-ring Installation (Kit No. 17043-95)
- Fuel Fitting Installation (Kit No. 27221-95)
- Adjustment Screw Installation (Kit No. 27217-95)
- Electronic Control Module (ECM) Installation (Kit Nos. 32423-97 and 32476-97)

For installation instructions for the above listed kits, see the 1997 FLT Service Manual (Part No. 99483-97), Section 9.

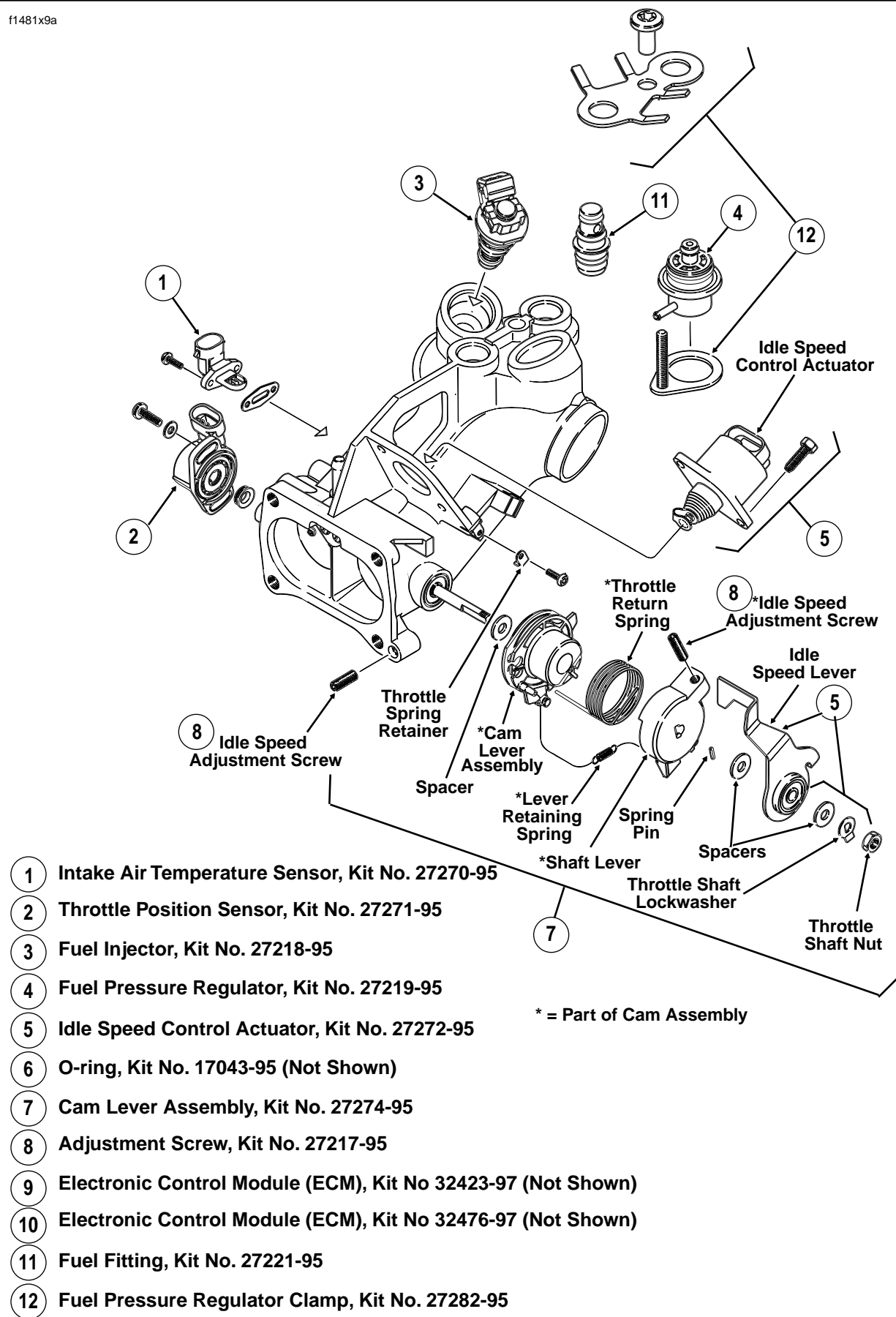


Figure 1. Induction Module Assembly

### Throttle Position Sensor Installation (Kit No. 27271-95)

For installation instructions see the 1997 FLT Service Manual (Part No. 99483-97), Section 9 (p. 9-115). NOTE: Use the voltage value listed in the 1997 manual only (this also applies to 1995 and 1996 EFI models).

### Fuel Injector Installation (Kit No. 27218-95)

For installation instructions see the 1997 FLT Service Manual (Part No. 99483-97), Section 9 (p. 9-113). NOTE: It is not necessary to remove the induction module from the motorcycle to replace the fuel injector. **To remove injectors while the induction module remains mounted on the motorcycle:** omit Step 1 (FUEL INJECTORS, Removal) and follow all steps as listed in the FUEL TANK, Partial Removal procedure (p. 9-93 or 9-94) to gain access to the injector. Follow Steps 2-6 (FUEL INJECTORS, Removal). **To install injectors while the induction module remains mounted on the motorcycle:** Follow Steps 1-6 (FUEL INJECTORS, Installation). Omit Step 7 (FUEL INJECTORS, Installation) and follow all steps as listed in the FUEL TANK, Installation (After Partial Removal) procedure (p. 9-94 or 9-95).

### Fuel Pressure Regulator and Fuel Pressure Regulator Plate Installation (Kit Nos. 27219-95, 27282-95)

For installation instructions see the 1997 FLT Service Manual (Part No. 99483-97), Section 9 (p. 9-113,114). NOTE: It is not necessary to remove the induction module from the motorcycle to replace the fuel pressure regulator. **To remove fuel pressure regulator while the induction module remains mounted on the motorcycle:** omit Step 1 (FUEL PRESSURE REGULATOR, Removal) and follow all steps as listed in the FUEL TANK, Partial Removal procedure (p. 9-93 or 9-94) to gain access to the fuel pressure regulator. Follow Steps 2-4 (FUEL PRESSURE REGULATOR, Removal) to replace fuel pressure regulator. **To install fuel pressure regulator while the induction module remains mounted on the motorcycle:** Follow Steps 1-4 (FUEL PRESSURE REGULATOR, Installation). Omit Step 5 (FUEL PRESSURE REGULATOR, Installation) and follow all steps as listed in the FUEL TANK, Installation (After Partial Removal) procedure (p. 9-94 or 9-95).

### Idle Speed Control (ISC) Actuator Installation (Kit No. 27272-95)

#### ISC Actuator Removal

##### NOTE

*When replacing the ISC actuator only, a cold idle throttle position sensor voltage reading must be taken before removing the old ISC actuator and after installing the new ISC actuator. After the new ISC actuator is installed, the cold idle reading must match the initial reading. Slight adjustment of the cold idle speed set screw may be required. The adjustment procedure is explained later in this document.*

*When replacing both the ISC actuator and the cam lever assembly both cold idle and warm-slow idle throttle position sensor voltage readings must be taken before and after replacement. The readings after installation of the new ISC actuator and cam lever must match the initial readings. Slight adjustment of the cold idle and warm-slow idle speed set*

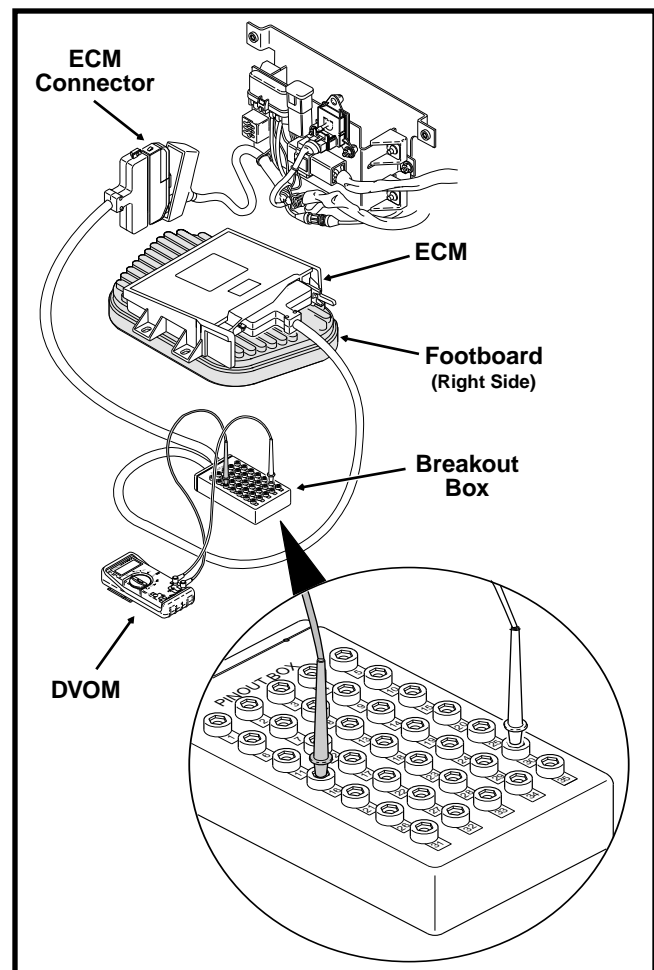


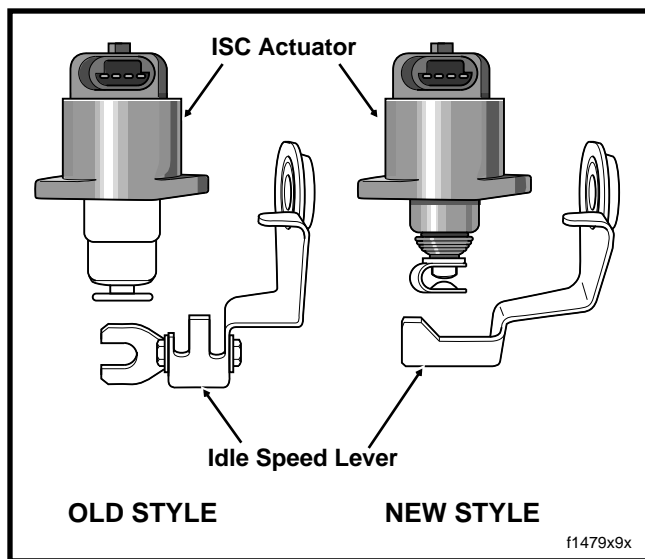
Figure 2. Breakout Box Installation

screws may be required. The adjustment procedure is explained later in this document.

1. See Figure 2. Install the breakout box (HD 41198) between ECM and EFI wiring harness. See Section 9 (p. 9-22) of the 1997 FLT Service Manual (Part No. 99483-97).
2. Turn ignition switch to ON, but do not start engine.
3. Measure the throttle position sensor voltage between pins 16 and 30 on the breakout box using a DVOM (Fluke 78 multimeter, HD-39978). This is the **cold idle** reading. NOTE and RECORD the reading.
4. Remove air cleaner and backplate assembly. See Section 9 (p. 9-105) of the 1997 FLT Service Manual (Part No. 99483-97).
5. Partially remove fuel tank. See FUEL TANK, Partial Removal in Section 9 (p. 9-93 or 9-94) of the 1997 FLT Service Manual (Part No. 99483-97). NOTE: Leave negative cable installed on battery.
6. Standing on the left side of the motorcycle, remove the two 8 mm ISC actuator torx mounting screws using a 1/4 in. drive, 12 in. extension with a swivel, and another 4 in. extension.

##### NOTE

*The front injector connector may need to be removed for clearance. Route extension above top motor mount and between the throttle cables and the front cylinder head.*



**Figure 3. ISC Actuator and Idle Speed Lever (Top View)**

7. See Figure 1. Bend tab on throttle shaft lock washer away from flat of throttle shaft nut. Turn idle speed lever mechanism counter-clockwise until throttle plates are in the fully open position and then remove 10 mm throttle shaft nut and spacer from throttle shaft end. Remove and discard the throttle shaft lock washer.
8. Remove spacer and idle speed lever from throttle shaft disengaging fork from pintle of idle speed control actuator. NOTE: Fork is only present on old style actuator. See Figure 3 for comparison of old and new actuator and idle speed levers.
9. Remove ISC actuator from mounting flange.
10. Remove connector from ISC actuator.

**NOTE**

*If replacing cam lever, do the following Cam Lever Installation procedure (begin at Step 7). If replacing ISC actuator only, continue with ISC Actuator Installation procedure on following page.*

## Cam Lever Assembly Installation (Kit No. 27274-95)

**NOTE**

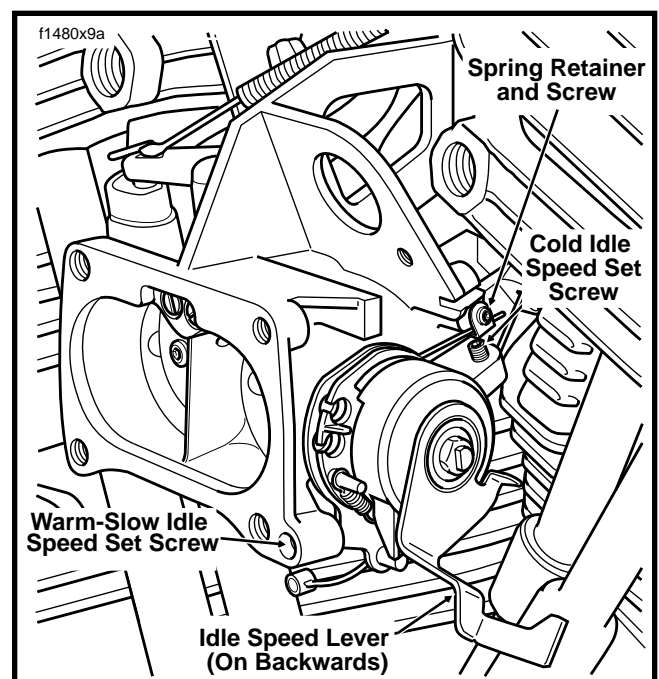
*Do Steps 1-6 if only replacing cam lever. If ISC actuator has been removed, begin procedure at Step 7.*

1. See Figure 2. Install the breakout box (HD 41198) between ECM and EFI wiring harness. See Section 9 (p. 9-22) of the 1997 FLT Service Manual (Part No. 99483-97).
2. Turn ignition switch to ON, but do not start engine.
3. Measure the throttle position sensor voltage between pins 16 and 30 on the breakout box using a DVOM (Fluke 78 multimeter, HD-39978). This is the **cold idle** reading. NOTE and RECORD the reading.
4. Remove air cleaner and backplate assembly. See Section 9 (p. 9-105) of the 1997 FLT Service Manual (Part No. 99483-97).

5. Partially remove fuel tank. See FUEL TANK, Partial Removal in Section 9 (p. 9-93 or 9-94) of the 1997 FLT Service Manual (Part No. 99483-97). NOTE: Leave negative cable installed on battery.
6. Remove nut, spacer and idle speed lever.
7. See Figure 4. Reinstall idle speed lever **backwards** and secure with spacer and nut.
8. Measure the throttle position sensor voltage between pins 16 and 30 on the breakout box using a DVOM (Fluke 78 multimeter, HD-39978). This is the **warm-slow idle** reading. NOTE and RECORD the reading.
9. See Figure 1. Remove the throttle cables from the cam plate.
10. Remove spring retainer screw and spring retainer from the induction module.
11. Remove throttle shaft nut, spacer, idle speed lever, cam assembly with spring pin and spacer from the throttle shaft.

**NOTE**

- Note location of spring pin located between flat of throttle shaft and shaft lever.
  - Cam assembly consists of the cam lever assembly, shaft lever (w/idle speed adjustment screw), throttle return spring and lever retaining spring and is shipped assembled.
12. Install **new** spacer and **new** cam assembly to throttle shaft.
  13. See Figure 4. Loosely install **new** spring retainer to induction module with spring retainer screw. Insert throttle return spring between induction module and spring retainer. Tighten spring retainer screw.
  14. Install **new** spring pin between flat of throttle shaft and shaft lever.



**Figure 4. Idle Speed Lever Installed Backwards**

15. Install **new** spacer and idle speed lever to throttle shaft **backwards** and secure with spacer and **new** throttle shaft nut.
16. Adjust **warm-slow idle** throttle position sensor voltage to match reading taken in Step 7. Adjustments are made by adjusting warm-slow idle speed set screw (located in lower right corner of injector module on throttle plate side).
17. Remove nut, spacer and idle speed lever. Reinstall idle speed lever (in correct position), spacer and throttle shaft lockwasher. Start throttle shaft nut onto shaft.
18. Open the throttle and insert a screwdriver's plastic handle into one of the throttle bores (to keep it open and prevent shaft from rotating) and tighten throttle shaft nut to 25 **in-lbs** (2.8 Nm). Remove screwdriver after nut is tightened.
19. Bend tab on throttle shaft lockwasher against flat of throttle shaft nut.
20. Install throttle cables to cam lever assembly.
5. Open the throttle and insert a screwdriver's plastic handle into one of the throttle bores (to keep it open and prevent shaft from rotating) and tighten throttle shaft nut to 25 **in-lbs** (2.8 mm). Remove screwdriver after nut is tightened.
6. Bend tab on throttle shaft lock washer against flat of throttle shaft nut.
7. Using the idle speed lever, open and close the throttle plates to check for proper operation. Be sure that the mechanism operates smoothly without binding or sticking.
8. Install fuel tank. See Section 9 (p. 9-94 or 9-95) of the 1997 FLT Service Manual (Part No. 99483-97).
9. Install seat. See Section 2 (pp. 2-61,62) of the 1997 FLT Service Manual (Part No. 99483-97).

#### NOTE

*Do steps 21-25 if only replacing cam lever assembly (ISC actuator has NOT been removed). If replacing ISC actuator and cam lever assembly, continue with ISC Actuator Installation.*

21. Disconnect breakout box and DVOM.
22. Adjust throttle cables. See Section 2 of the 1997 FLT Service Manual (Part No. 99483-97).
23. Install ECM, side cover and saddlebag.
24. Install air cleaner and backplate assembly. See Section 9 (p. 9-105) of the 1997 FLT Service Manual (Part No. 99483-97).
25. Install fuel tank. See Section 9 (p. 9-94 or 9-95) of the 1997 FLT Service Manual (Part No. 99483-97).

## ISC Actuator Installation

1. See Figure 1. Insert **new** ISC actuator in throttle housing flange with electrical connector facing upward. Install electrical connector to ISC actuator.
2. Coat threads of two **new** 8 mm torx mounting screws with Loctite 222 (Purple). Install ISC actuator to throttle housing flange with two 8 mm torx screws. Tighten torx mounting screws to 12 **in-lbs** (1.4 Nm).

#### NOTE

*Do steps 3-6 only if cam lever assembly has NOT been replaced. Otherwise go to Step 7.*

3. Install **new** idle speed lever onto throttle shaft making sure flat section of lever is positioned between spring clip and actuator pintle end.
4. Install spacer and **new** throttle shaft lock washer on throttle shaft end. Start 10 mm throttle shaft nut onto shaft.

#### WARNING

**After installing seat, pull upward on front of seat to be sure it is locked in position. If seat is loose, it could shift position during vehicle operation and startle the rider, causing loss of control and personal injury.**

#### NOTE

*DO NOT install air cleaner assembly .*

10. Cycle ignition switch on and off three (3) times, waiting 10 seconds between each cycle.
11. Turn ignition switch to ON, but do not start engine.
12. Measure the throttle position sensor voltage between pins 16 and 30 on the breakout box using a DVOM (Fluke 78 multimeter, HD-39978). This is the **cold idle** reading. NOTE and RECORD the reading. Adjust the cold idle speed set screw (located on the cam cover) until **cold idle** reading is the same as the **cold idle** reading taken in Step 3 of ISC Actuator REMOVAL.
13. Start engine and warm to operating temperature. Adjust warm-slow idle speed set screw to prescribed specifications. See Section 9 (p. 9-106) of the 1997 FLT Service Manual (Part No. 99483-97).
14. Disconnect breakout box and DVOM.
15. Install ECM, side cover and saddlebag.
16. Install air cleaner and backplate assembly. See Section 9 (p. 9-105) of the 1997 FLT Service Manual (Part No. 99483-97). NOTE: Installation of air cleaner cover may affect idle speed.

## Credit Procedure

Fuel injection components claimed under warranty will be called back with a bar coded label after the claim is submitted. The parts and labor will be credited. The parts will then be tested. If no problem is found, the part will be scrapped and unless there is an extenuating circumstance, that claim event will be rejected/debited. As with our long-standing warranty policy, service personnel should always be certain that any part is faulty before submitting a warranty claim.

After servicing each vehicle, complete a regular Warranty Claim Form referencing Service Bulletin M-1066 in the "DESCRIPTION OF REPAIR" section of the form.

### Warranty Job Time/Codes Table

Procedure (Replacement)	Labor Code	Time
Throttle Position Sensor	5389	0.6 hr.
Idle Speed Control Actuator	5390	0.6 hr.
Intake Air Temperature Sensor	5386	1.4 hr.
Fuel Injector(s): (1)	5387	1.0 hr.
(2)	5388	1.1 hr.
Cam Lever Assembly	5391	0.7 hr.
Fuel Pressure Regulator	3515	1.0 hr.

ROUTING	SERVICE MANAGER	SALES MANAGER	PARTS MANAGER	LEAD TECHNICIAN	TECHNICIAN NO. 1	TECHNICIAN NO. 2	TECHNICIAN NO. 3	TECHNICIAN NO. 4	RETURN THIS TO:
INITIAL HERE									

1996 Harley-Davidson<sup>®</sup> Motor Company